

A NEW SPECIES OF THE GENUS *NEORIBATES* (BERLESE, 1914), *NEORIBATES RIMOSUS* N. SP.

(ACARIDA : ORIBATIDA)

By

Keiichi SUZUKI

5-88 Senju, Adachi-ku, Tokyo 120, Japan

Synopsis

SUZUKI, Keiichi (5-88 Senju, Adachi-ku, Tokyo 120, Japan): A new species of the genus *Neoribates* (BERLESE, 1914), *Neoribates rimosus* n. sp. (Acarida: Oribatida). *Acta Arachnol.*, 28: 19-29 (1978).

Two neoribatid species, *N. aurantiacus* and *N. macrosacculatus*, have hitherto been recorded from Japan. The present new species is easily distinguishable from the two Japanese and the other known American and European species by the following characters: (1) notogaster and pteromorpha have numerous short slit-like fissures, (2) aspidosomal tectum has minute granulous surface structure, (3) ventral, genital and anal plates have cribrate surface and (4) adanal setae are complete: ad_1 and ad_2 are very long and are somewhat shorter than 1/2 of the body length.

Date issued as an available name for *N. gracilis* TRAVÉ is discussed and was corrected from 1972 to 1970.

The present new species was collected from the litter of *Cryptomeria japonica* forest. Among neoribatid species *N. aurantiacus* and *quadrisetosus* have hitherto been known as the species possessing long adanal setae ad_1 and ad_2 . The present new species has also long adanal setae and complete ad_3 (the seta absent in the former species).

I wish to express my hearty thanks to Prof. Dr. J. AOKI who gave several suggestions on the problem for nomenclature of *N. gracilis*.

Description

Material examined. — Holotype (NSMT-Ac-9281): Nishi-nasuno, Nasu-gun,

Tochigi-kén, Central Japan. 19711031. leg. K. SUZUKI. Paratypes (5 adults): the same data as the holotype.

Measurement. — Length: 480 (527) 560 μ ; width: 285 (283) 350 μ .

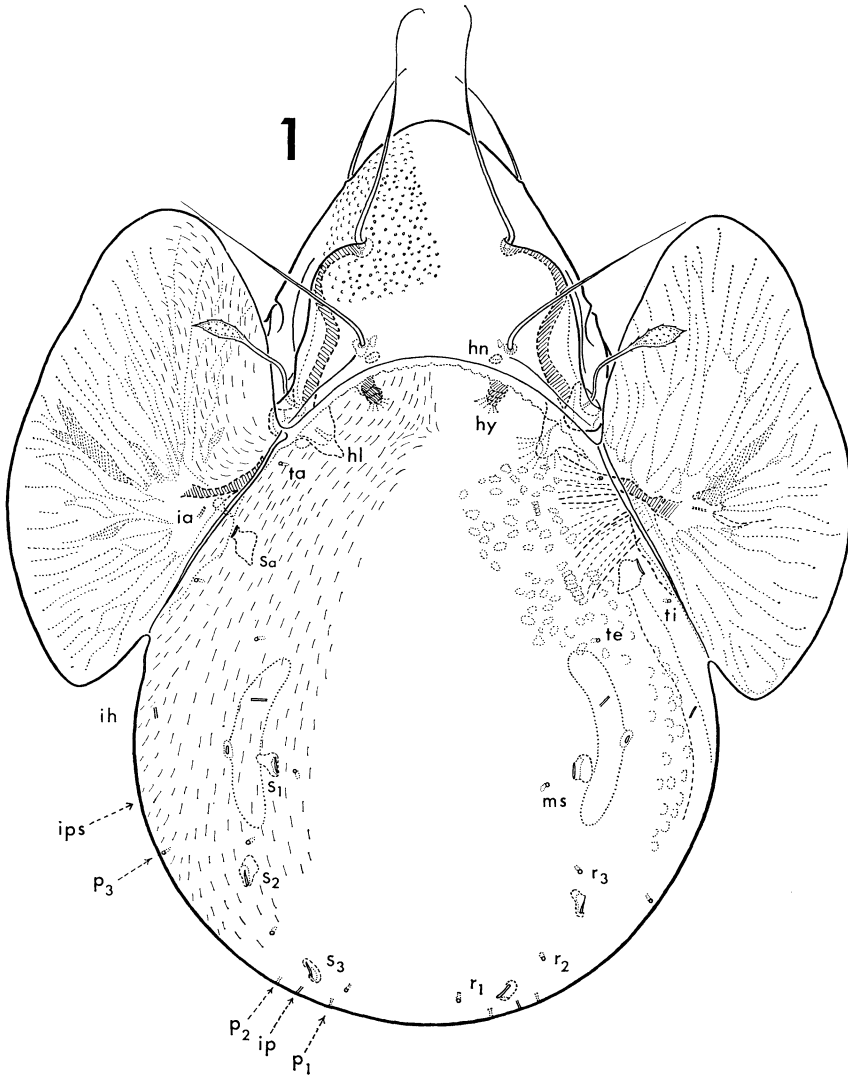


Fig. 1 Dorsal side of *Neoribates rimosus* n. sp.

Tegumental structure is partly drawn. Sensillar head is possessed of minute spines and is sharply terminated.

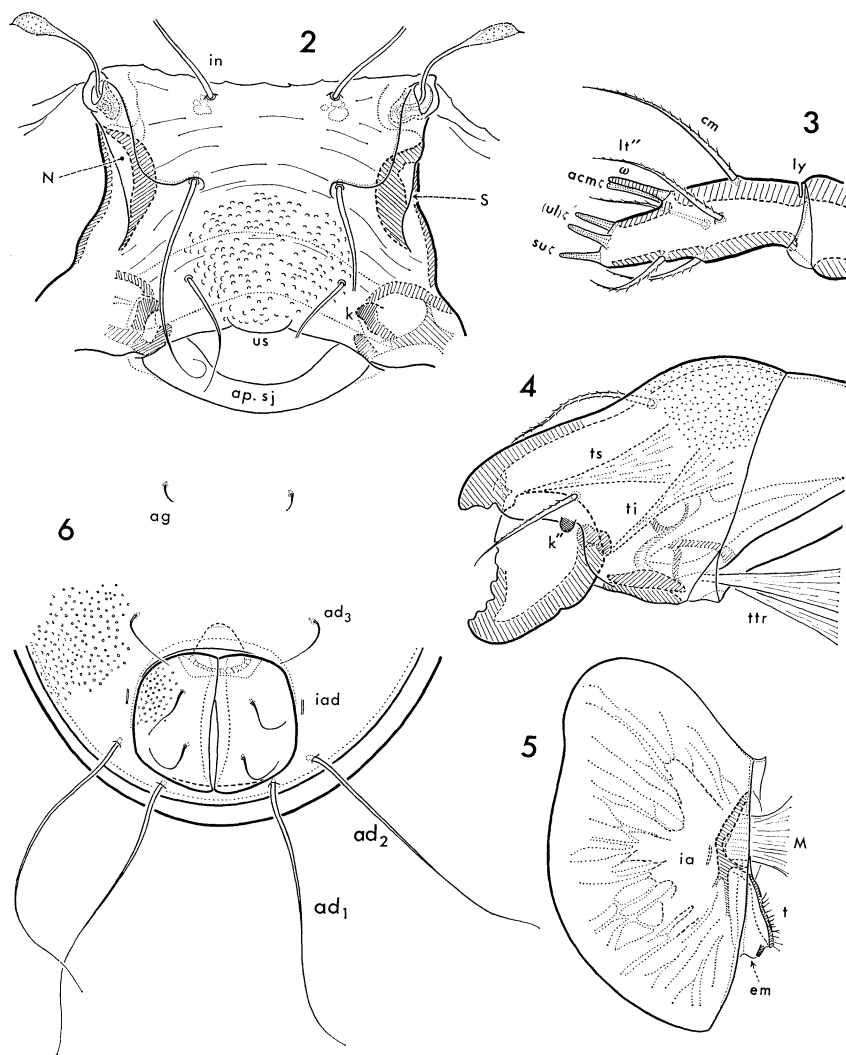
Habitus, tegument and colour. — The shape of the body typical neoribatid form. The present new species well resembles *N. gracilis* in the body shape. Pteromorpha not so large (longer than 1/2 of hysterosoma). The anterior margin of *ptm* never extends beyond or reaches to rostrum. Lamellar region distinct and somewhat elevated (Fig. 1). Colour of the body is blackish brown. Cuticle not so thick and distinctly granulated in aspidosoma and hysterosoma without notogaster and *ptm*, while in notogaster and *ptm* the cuticle ornamented with numerous short slits (Figs. 1, 2 and 5). Slits of notogaster not the same each other: in the anterior part of the tectum, near dorsodisejugal furrow *disj*, they relatively short, gradually becomes in simple pits in the anteriormost part of notogaster. In lateral view, near the anterior part of sublamellar carina *S*, it can be observed that the cuticle of the area apparently wrinkled (Fig. 15): this state resembles pedal wrinkles which are recognized on femora and trochantera III-IV in most of superior oribatids. The slit-like structure also found in the area between *ac. I* and *ac. II*, but in this area the slits sparsely arranged. Cuticle of propodosoma and ventral side, even genital and anal plates, ornamented by minute pits (Figs. 13a and 13b): in coxisternal plate the ornamentation obscure, each pit more sparsely arranged in contrast with the other parts; in the lateral side of metapodosoma, near *ac. IV*, such pits also observed, but each pit somewhat longer than that of the area mentioned above. Pedal cuticle not decorated with any of structures without trochantera and femora III-IV cuticles of which wrinkled like in the other superior oribatids.

Cerotegument of the body generally thin and indistinct, but in the lateral side of podosoma, concentration of the secretion which is granule structure and whitish can be observed apparently.

A network-like structure can be seen among carinae *c. s.*, *c. a.* and sublamellar carina *S*: this structure not so visible and is perhaps internal muscular insertion spots for chelicerae or infracapitulum.

Aspidosoma. — Anterior tip of rostrum somewhat protruded: the protrusion *us* well visible in observation from the lateral and frontal side (Figs. 2 and 15). Lamellar carina *L* distinct: anterior part of the structure strongly curved inward (Fig. 1). Posterior part of *L* smoothly continues to bothridium which is provided with sensillus with a clavate head terminated in a point. Relatively short sublamella *S* can be found: *S* is not simple carina, but is the border of the eaves with a deep hollow which is indicated by an abbreviation *N* in Fig. 1, 2 and 5. The deepest part of the hollow *N* extends near the insertion of inter-

amellar seta *in*. Behind *in* a small chitinous internal phragma *hn* (Fig. 1) can be detected indistinctly; the phragma homologous to *ap* of *N. gracilis*.



Figs. 2-6 *Neoribates rimosus* n. sp.

2) Frontal view; *in*, *le* and *ro* are partly cut, chelicerae and infracapitulum are removed. 3) The left palp 4) The left chelicera; movable digit is open. 5) The left pteromorpha removed; phragma *em* takes a part of a hinge with muscles for *ptm* and notogaster. Surface slit-structure is omitted. 6) Anal region.

Aspidosomal setae *ro*, *le*, *in* and *ex* all smooth, never ciliated. Lamellar seta *le* inclinate, while interlamellar seta exocline; *in* strongly curved outward at the basal part. Anterior tips of *ro*, *le* and *in* all gently curved (Fig. 15). Exobothridial seta *ex* minute, being located near the upper distal end of *c. s.* Sensillus *ss* has a calvate head with minute spines; the peduncle of *ss* suddenly elbowed at the point of approximate 1/3 of the whole length (Fig. 1). Dorso-disjugal area porosa *Ad* absent in the present new species.

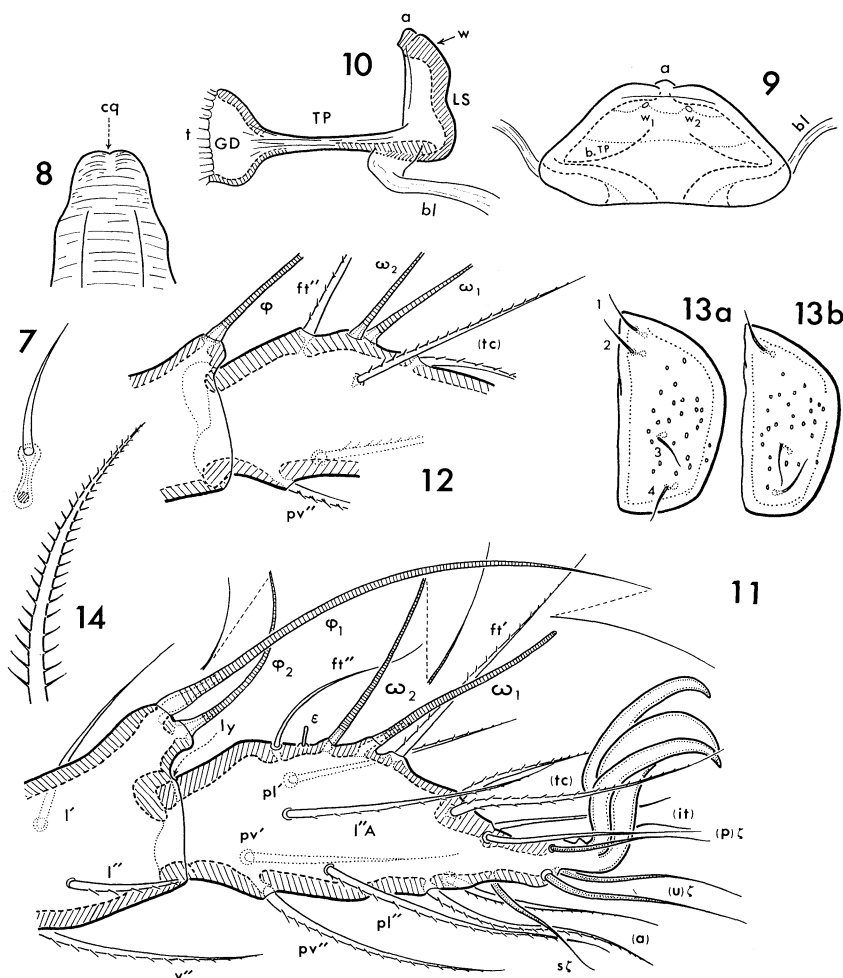
Lateral side. — In the lateral side of podosoma two areae porosae can be detected indistinctly: under *S* area porosa *Al* can be found, being exposed its half profile (Fig. 15): humeral area porosa *Ah* located near the superior end of a long dorsal commissure line of acetabular tectum III. There are several carinae near *ac. I* and *ac. IV* like in *N. gracilis*: two carinae *c. s.* and *c. a.* exist in front of *ac. I*; the one is distinct and moderate, and the other is indistinct and rather short; a faint carina *c. par* is detected along the border of the acetabular tectum I; a distinct, curved carina *c. p.* located just behind acetabular tectum IV. A very minute orifice *z* of a gland situated at the upper side between *pd₂* and *ac. II*; the gland very slender and not so long. Circumpedal carina present: the pronounced circumpedal carina *cir. p.* extends its anterior tip beyond the level of carina *c. s.* and continues gradually to the border of podocephalic fosse *f₂*.

Epimeral setae *1c* and *4c* each on pedotectum I and discidium, so that their insertions can not be found in ventral aspect. Epimeral seta *3d* located at the inner side of *cir. p.*, never outside of *cir. p.*

Gnathosoma. — Infracapitulum diarthry type. Rutellum *RU* panthelebasic and not so broad; its anterior part well pigmented with black; *bru* or *pe* can be found like in other superior oribatids. Chelicera normal shape, never peloptoid (Fig. 4): cheliceral surface porous like in most oribatids; condyles *k'* and *k''* distinct and large; TRÄGÅRDH's organ *Tg* exists and normal moderate size; cheliceral setae *cha* and *chb* have minute ciliae bilaterally. Labrum *LL* not fusiform (Fig. 8): the distal end rather straight, but a shallow notch *cq* can be observed at the middle of the anterior margin; many faint transversal wrinkles run on its surface. Two pairs of adoral setae present; each seta normal setiform with barbs. Palpal chaetotaxy which includes solenidion ω can be resumed as (0-2-1-1-10): femur and tibia have two setae on each segment, but genu has only a single seta *d*. Tarsal segment has five ordinal setae, four eupathidia and a single solenidion: solenidion ω associated with eupathidial anteroclinal

seta $acm\zeta$ (this state indicated as $AcmS$). Solenidion ω and eupathidia (ul) ζ , $su\zeta$ and $acm\zeta$ subequal each other (Fig. 3).

Notogaster. — Oval in form. Ten pairs of notogastral setae present, but



Figs. 7-14 *Neoribates rimosus* n. sp.

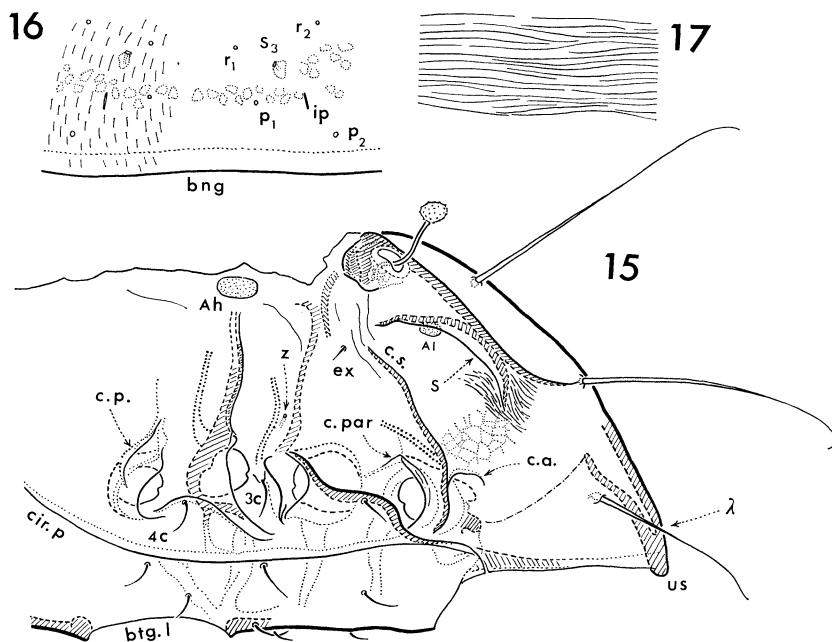
7) Notogastral seta ms and its apobase 8) Superior lip LS in dorsal view; cq indicates a shallow depression. 9) Preanal organ in ventral view. 10) Preanal organ in lateral aspect. 11) The right tarsus I. 12) The right tarsus II. 13a) The right genital plate of holotype (NS-MT-Ac-9281). 13b) The right genital plate of a specimen of paratypes; this plate shows chaetotaxic variation (vertition). 14) Femoral seta ev IV.

it is difficult to detect the setal profiels under low or median magnification because of their very minute length; those setae have apobase insertions. Notation of notogastral setae follows that of *N. gracilis*. Four pairs of sacculi *Sa*, *S₁*, *S₂* and *S₃* present: each sacculus relatively large and flattened. The opening of each sacculus never pore, but wide and flattened form. Anterior sacculus *Sa* not simple sack shape, but jar form with a protrudent bottum. Lyrifissures *ia*, *im*, *ih*, *ips* and *ip* present and arranged asymmetrically (Figs. 1 and 16). Anterior lyrifissure *ia* located on ventral side of pteromorpha (in the text figure *ia* is indicated by the broken line). Those lyrifissures not so large, shorter than that of *N. gracilis*. Dorsopragma *hy* well sclerotized, but pleurop-
hragma *hl* not so sclerotized; each phragma well visible and ordinal galumnid form. There are no racemiform organs *ra* on notogaster. Pteromorpha *ptm* has internal small niche the wall of which well sclerotized (Fig. 5). One of several pteromorphal muscles attached to the wall (in Fig. 5 this state drawn), while the other muscles and tendons attach to the phragma *em*. Conection notogaster-pteromorpha in *Erogalumna zeucta* GRANDJEAN, 1966 shows that an extension of notogastral tectum, "a trigingular hinge x_1 -a- x_2 ", takes a part of the hinge. In *N. rimosus* n. sp. this relation is reversed: a triangular pteromorphal cuticular extension *em* anterior end of which starts from the rather stout wall of the niche and the posterior limit continues to the exterior surface of pteromorpha conected with muscles and notogastal flexible cuticle. In the present new species pteromorphal fulrow *st* can not be observed, but the same stucture of *b₁*, *b₂*, and *b₃* which is not so distinct in *E. zeucta* recognized.

Membrane *TGS* densely wrinkled (Fig. 17) like in *Diapterobates izuensis*.

Coxisternal region. — Coxisternal chaetaxy as follows: each coxisternal seta relatively long and provided with ciliae. Seta *3c* located at simple *pd₂*, being the longest among coxisternal setae; the seta has bilaterally minute ciliae, but the remainig setae have not bilateral setation. Seta *3b* closely situated to circumpeal carina *cir. p* which is well visible at a glance. Circum-pedal carina strats from *BV* to the poserior border *f₂* of podocephalic fosse.

Anogenital region. — Genital plate has four setae: two arranged at the anterior part of the plate, and the remaining two situated at the posterior part (Fig. 13a); each seta simple and thin. Ovipositor normal *Eremaeus hepaticus* type: three lobes have 12 eugenital setae; among them *ta* and *tc* shorter than the other setae which are smooth, not spiniform and almost equal one another. Setal serie *k* can be detected normal number; a single *kd* and *kv*, and two

Figs. 15-17 *Neoribates rimosus* n. sp.

15) Lateral side of podosoma; notogaster is removed.

16) Hind view of notogaster. 17) Enlarged aspect of TGS.

laterals *kl* short spine-like. A pair of aggenital setae *ag* present: the setae also simple and rather thin like coxisternal setae except *3c*. Mutual distance *ag-ag* shorter than *ad₃-ad₃*. Anal plate has two flexible somewhat long setae (Fig. 6); the setae shorter than adanal seta *ad₁*. Three adanal setae very remarkable: *ad₁* and *ad₂* extraordinarily long and thicker than *ad₃*, being subequal each other. Adanal setae *ad₁* and *ad₂* somewhat shorter than half of the body length, while *ad₃* much shorter than those setae; *ad₃*, however, longer than the remaining ventral setae. Preanal organ well resembles *Mochlozetes penetrabilis* (Figs. 9 and 10): a frontal piece *LS* large and somewhat hard, having a small protubance *a* on its anterior margin; two very minute pores can be found in the anterior middle part of *LS*. A pair of membranous bands *bl* attached to the lateral side of *LS*: the band *bl* considered as a conjunctive membrane for preanal organ and ventral plate.

Legs. —All legs heterotridactylous. Two lateral claws thinner than middle claw *oc*, but not so thin unlike in *N. gracilis*. Chaeto- and solenidiotaxy summe-

rized as follows: I (1-5-3-4-19-3), II (1-5-3-3-14-3), III (2-3-1-3-15-3), IV (1-2-2-2-12-3); I (0-0-1-2-2), II (0-0-1-2-2), III (0-0-1-1-0), IV (0-0-0-1-0).

Tarsus I has two solenidia ω_1 and ω_2 . Solenidion ω_2 I filiform and longer than ω_1 , while the later ω_1 I not filiform, but baciliform and thicker than ω_2 I; ω_1 I longer and has more blunt tip than in *N. gracilis*. Famulus ϵ minute and spine-like with a blunt tip; the seta located between ω_1 I and smooth ft'' which is thinner and shorter than ft' which is ciliated. A single accessory seta l'' A located at rather posterior part. Accessory ventral setae v' and v'' does not exist.

Setal number of tarsus II is reduced to 14 because of the absence of primilateral setae (pl), accessory seta l'' A and paraxial fastigial seta ft' . In those reduction the absence of ft' very remarkable due to its rare case. Two ceratiform solenidia ω_1 II and ω_2 II present: each solenidion subequal, but shorter than ω_1 I; they closely situated each other (Fig. 11). Fastigial seta ft'' II and ft' IV absent like in other oribatids.

Tibia I and II have an apophyse for solenidia each other. In tibia I the apophyse stout, and two filiform solenidia φ_1 I and φ_2 II inserted on it. Solenidion φ_1 I longer than φ_2 I (Fig. 11). A single filiform solenidion φ II longer than ω_1 II and ω_2 II. Tibia IV has only two setae (l) and has no solenidia; the absence of φ characteristic as TRAVÉ stated.

Basiventral bv , ventral v and lateral seta l'' of femur I very thin, being smooth without v . On femur IV a distinct seta ev located (Fig. 14): its barbation not the usual state and resembles a vertebra of a bony fish. Femur of each leg longitudinally wrinkled, being wide like in most of superior oribatids. The segment has an slightly developed thin crest which well resembles that of *N. gracilis*.

Tarsus, tibia and femur of each leg have pedal areae porosae on their ventral or paraxial sides. Tarsal area porosa po , occupied its position at posteroventral part between ventral setae (v) and its tarsal articulation; tibial area porosa can be seen at the anteroventral side, while in femur the structure located at the dorsoparaxial side. Dorsal area porosa absent on all legs. Dorsal surface of tibiae III and IV not smooth, but several weak depressions can be found posteriad.

Remarks

Remark 1. — COMPARISON WITH OTHER NEORIBATID SPECIES.

The present new species well resembles *Neoribates aurantiacus* (OUDEMANS, 1914) and *N. quadrisetosus* (EWING, 1917) in having long adanal setae ad_1 and ad_2 , but is easily distinguishable from the former species by the presence of aggenital setae and from the later species by the presence of ad_3 . *N. rimosus* n. sp. is different from the two species in having notogaster and pteromorpha with slit-like fissures, and genital, anal plates with cribrate texture.

Adanal setae ad_1 and ad_2 of the present new species are much longer and more flexible than those of the two species; ad_1 and ad_2 of the two species are shorter than anal opening, while the setae of the present new species are about twice as long as anal one.

Remark 2. — *Neoribates gracilis*, ITS BIBLIOGRAPHICAL NOTE.

The name *Neoribates gracilis* appeared first in the TRAVÉ's work "Les stases immatures du genre *Neoribates* (Parakalumnidae, Oribates). Parakalumnidae et Galumnidae" (*Acarologia*, 1970, **12**(1): 208-215) with text figures: in this paper he generalized parakalumnid and galumnid immature stases, writing "...*N. gracilis* TRAVÉ une espèce nouvelle." in the text. Indication "Cette espèce est décrite dans un travail à paraître prochainement" is also written on its foot-note.

As mentioned above this species was recognized as a new species by him, but the full description was not issued at that time. Though there is no full description, a short description can be found in the paper.

In 1971 *N. gracilis* was used again in *Vie Milieu*, 1971, **22**(1): 78-89 by TRAVÉ & DURAN.

The full description of *N. gracilis* with indication "n. sp." was first published in *Acarologia*, 1972, **23**(2): 410-427 by him.

He wrote already several morphological characters of adult and immature stases in the paper in 1970, viz. gastronomic, anal, aggenital, genital and epimeral chaetotaxies in ontogenetic development. Can we recognize the paper as a formal description? The paper contains even a part of characters of *gracilis* and the figures of adult and nymphal stases, so that it is sufficient to recognize as a formal description.

Therefore the date issued as an available name for the species must be changed from 1972 to 1970: *Neoribates gracilis* TRAVÉ, 1970.

Remark 3. — GENITAL CHAETOTAXY.

In my specimens of the present new species only a single specimen has the chaetotaxy 4-3 (Fig. 13b), while the remaining specimens have 4-4. Characters

of other parts of the individual are of the same as the remaining specimens.

It is hard to say whether it is an abnormal individual or a individual variation because of few total number of specimens.

References

- AOKI, J., 1966. The large-winged mites of Japan (Acari: Cryptostigmata). *Bull. Natn. Sci. Mus. Tokyo*, **9**: 257-275.
- EWING, H. E., 1917. New acarina. Part II. Descriptions of new species and varieties from Iowa, Missouri, Illinois and Ohio. *Bull. Amer. Mus. nat. Hist.*, **37**: 161, pl. III.
- JACOT, A. P., 1929. American oribatid mites of the subfamily Galumninae. *Bull. Mus. Comp. Zool.*, **69**: 16-21, pls. 4-5.
- OUDEMANS, A. C., 1914. Acarologisches aus Maulwurfsnestern. *Arch. f. Natg.*, **79**: 1-69, pls. 15-18.
- 1917. Notizen über Acari. 26. Reihe (Oribatoidea). *ibid.*, **83**: 15-22.
- SIBLEY, C. G., 1954. The contribution of avian taxonomy. *Syst. Zool.*, **3**: 107.
- SUZUKI, K., 1971. Some new species of oribatid mites from the Izu peninsula. II. *Diapterobates izuensis* n. sp. *Bull. biogeogr. Soc. Jap.*, **27**: 13-18.
- TRAVÉ, J., 1970. Les stases immature du genre *Neoribates* (Parakalumnidae Oribates). *Parakalumnidae et Galumnidae. Acarologia*, **12**: 208-215.
- 1972. *Neoribates gracilis* n. sp. (Parakalumnidae, Oribate). *Acarologia*, **13**: 410-427.
- TRAVÉ, J. & DURAN, F., 1971. Developpement et comportement en laboratoire de *Neoribates gracilis* TRAVÉ (Acarien Oribate). *Vie Milieu, ser. C*, **22**: 79-89.
- WILLMANN, C., 1931. *Die Tierwelt Deutschlands*. **22**: 79-200.

摘 要

鈴木恵一（東京都足立区千住5-88）：フロフロソデダニ属の一新種 *Neoribates rimosus* n. sp. ヒビフロフロソデダニ（新称）の記載。

日本からケタフロソデダニ科 Parakalumnidae に属するフロフロソデダニ属 *Neoribates* の要員は従来、*N. macrosacculatus* AOKI と *N. aurantiacus* (OUDEMANS) の2種が知られていたが、これらとは明らかに異なり（他の今までに記録されている9種とも異なる）新種とすべき個体が得られたので命名、記載した。

他種との主要な識別点は、(1) 背板、翼状突起の体表は多数の短いスリット状の構造がある、(2) 前体部背面の体表に小顆粒状構造がある、(3) 腹板、肛扉上にも小孔構造 cribrate がある、(4) 肛側毛 ad_1 , ad_2 は非常に長く、 ad_3 は短いが存在する。

また、*N. gracilis* の命名規約上の問題を検討し、その発表年を1972から1970年に移動した。